

Name: **ANDREW R. MOLNAR**

I. EDUCATION.

University of Maryland, BA Psychology 1952

University of Maryland, MA Psychology 1955

Hillyer College, University of Hartford, Certificate, Design Engineer 1956

University of Maryland, PhD Psychology 1959

II. EXPERIENCE.

CONSULTANT (1995-2000)

I provided consultant services and administered the Department of Defense Education Activity (DoDEA)/National Science Foundation (NSF)/DARPA program to integrate technology into the K-12 Program for Dependent Schools in Italy and Germany (1995-1997).

Member of the Technical Advisory Panel for Courseware Development, DoDEA, Arlington, Va., April 1-2, 1996.

Made a Speech, "*Mathematics, Science and Engineering and the Internet*", Aviano, Italy, April 22, 1996.

Chaired an NSF Panel for *Collaborative Research on Learning Technologies* (1996).

I was a consultant to NSF and wrote a report, "*State of the Art Research on Policy and Practice Affecting Technology Used in Education and the Directions NSF Should take*". May 2, 1997

I wrote an invited paper, "*Computers in Education: A Brief History*", THE Journal, June, 1997.

Invited participant at the *Advanced Distributed Learning Workshop* sponsored by the Department of Defense, Alexandria, VA, October, 5-8, 1999.

NATIONAL SCIENCE FOUNDATION (NSF), Washington, DC, Program Director 1970-1995.

Program Director of the *Applications of Advanced Technologies (AAT) Program (1983-1995)*. I was responsible for a grants program for research and development on advanced computer and telecommunications technologies and their applications in mathematics, science, and engineering education. The Program supported innovative research on intelligent tutors, knowledge-based systems, computational tools, problem-solving, authoring systems, and the development of instructional materials for all levels of education. I Chaired Annual Project Directors Meetings. (See *AAT Summary of Grants, FY 1984-86*, *AAT Summary of Awards Fiscal Years 1987-1990*, and *AAT Description of Funded Projects, Sept 1984*; and Christine Youngblot, Institute for Defense Analyses (IDA), Alexandria, VA "*Government Sponsored Research and Development Efforts in the Area of Intelligent Tutoring Systems*", 1994.

AAT grantees received numerous professional awards for their contributions. While the number is too numerous to cite here, several notable examples may suffice. November 13, 1990, Dr. Patrick Suppes of Stanford University, in a White House Ceremony, received the National Medal of Science for his work on computers in education. Dr. Robert Tinker of Technical Education Research Center (TERC), on June 1990, received the Siemens/Smithsonian Award for his influential work on computers and telecommunications in the classroom. In 1991, Dr. Seymour Papert of the Media Lab/MIT received the EDUCOM/IBM Louis Robinson Award for Exceptional Achievement in the Applications of Information Technology to Teaching and Learning in AI and educational computing. (see Andrew R Molnar, *Applications of Advanced Technologies : A Brief Overview 1984-1990*)

I chaired a Joint Interagency Program (NSF/DARPA) that allowed qualifying universities to use the *Very Large Scale Integration (VLSI) Fast Turnaround Facility* to fabricate chips for university undergraduate and graduate

education programs and computer architecture courses (1983-1985).

Invited speech, "*Information and Communication Technology: Today and in the Future*", at the Lifelong Engineering Education Symposium, Royal Swedish Academy of Engineering Sciences, Stockholm, Sweden, October 27,28, 1988. I also attended, as an invited guest, the 69th Annual Meeting and Banquet of the Royal Swedish Academy and was introduced to His Majesty, King Carl XVI Gustaf and Her Majesty Queen Silvia.

Request for Proposals for the *Department of Defense Dependent Schools Networking and Interactive Technologies Program*. I was on two Interagency review Panels to evaluate proposals for NSF Supercomputer Training Institutes (1985,1986). I was the NSF Representative for the Subcommittee of the Education/Technology, Federal Interagency Committee on Education (FICE).

GEORGE MASON UNIVERSITY, Fairfax VA, Research Professor of Public Policy and Education (Oct 1991-Oct 1992). At the Institute for Public Policy and the Center for Interactive Educational Technology, I conducted policy research on technology and telecommunications. (Sabbatical)

PAST NSF ACTIVITIES.

Program Director, *Award Administration and Liaison Section* of the Office of Scientific and Engineering Personnel and Education (1980-1983).

I administered a research and development program for science, mathematics, and engineering education. I was responsible for initiating and organizing the first *Presidential Awards for Excellence in Science and Mathematics Teaching Program* for President Ronald Reagan. This required coordination with scientific and teaching associations in the selection of one hundred four winners and planning and coordinating the *White House Award Ceremonies* (1983). I also coordinated research activities on *Cognitive Processes and Mathematics and Computers Programs* with the National Institute of Education (1980-1983).

Program Manager, *Research in Science Education (RISE)* (1976-1983).

I managed a program for research and development on learning and teaching, and cognitive science, I also developed and administered a program for computers and computer related technology for science and mathematics education. I served as the Executive Secretary for the NSF's Advisory Council Task Force for the *Study of Continuing Education of Engineers and Computer Professionals in Universities and Industry* (1980-1981).

Program Director, Applications and Courseware, *Technological Innovation in Education (TIE)* (1973-1976).

I developed and directed a program for new, innovative applications of technology in education .

Program Director, Computer-Oriented Curricular Activities, *Office of Computing Activities (OCA)*(1970-1973).

In 1967, President Lyndon Johnson directed NSF, working with USOE, to establish an experimental program for developing the potential for computers in research and education. In July of 1967, OCA was established to provide Federal leadership in exploring and developing computer technology and uses of the computer in science and education. I directed a program of grants and contracts for innovative uses of computers in science, mathematics, and engineering education.

UNITED STATES OFFICE OF EDUCATION (USOE), Washington, DC Acting Director 1966-1970

Division of Higher Education Research. I supervised five branches of approximately forty research and support personnel; planned, initiated and reviewed programs for higher education research, including basic research, organization and administration, instructional materials and practices, research training, foreign languages and comparative education (Aug 23,1967-1970).

Commissioner of Education, Harold Howe, appointed me to the *Federal Interagency, Special Committee for Educational Uses of Computers* (June 22, 1967- Oct 25, 1968)

Detailed to the Bureau of the Budget (BOB) for a period of four months for a research study to develop projections of the research needs of various Federal programs (Nov 18, 1968-Mar 1969).

Chief, Instructional Materials and Practices Branch (DHER). I supervised two research teams (10 members) in planning, reviewing and monitoring projects and programs in curriculum and educational technology in higher education (1966-1970).

Executive Secretary for the *New Educational Media Advisory Group*: I planned, scheduled and held meetings for the Commissioner of Education; I was responsible for the planning and coordination of Title VII, *National Defense Education Act, New Educational Media Research Program* (1967-1968). I conducted a study USOE Support for Computers in Education.

Research Coordinator: reviewed proposals and coordinated research grants and contracts (1966-1967).

THE AMERICAN UNIVERSITY, Washington, DC, Associate Professor of Research; Senior Research Scientist. 1961-1966

Special Operations Research Office (SORO) and the Center for Research on Social Systems (CRESS), I directed and participated in research designed to apply social science information and techniques to problems of counterinsurgency; I was responsible for five research teams; a member of a three-man research advisory committee which was responsible for review and evaluation of all research.

Directed research teams which studied: 1) undergrounds in insurgent, revolutionary, and resistance warfare, 2) internal security in developing nations, 3) riots and civil disturbances, 4) human factors considerations in underground operations, 5) polygraphy and polygraph applications to counterinsurgency, and 6) the development of criteria for evaluating counterinsurgency tactics.

SYSTEM DEVELOPMENT CORPORATION (SDC), Santa Monica, CA, and Paramus, NJ Human Factors Scientist 1959-1961

Member of a team that wrote a book to provide human factors personnel with an understanding of simulation as a primary training and research medium. Member of a team that designed studies for the evaluation of the decision-making aspects of the Strategic Air Command 465L Command-Control System in a large-scale Simulation Facility (SIMFAC). I also taught course on Personal and Subjective Probability.

CARMODY CORPORATION, Buffalo, NY Director of Research and Training: 1958-1959

Member of the Management Committee that supervised company business activities; I helped develop industrial and military training programs and simulators; performed human factors analysis; organized and conducted factory training for operator and maintenance personnel for the WF-2 Anti-Submarine Warfare (ASW) Multi-Engine Aircraft Procedures Trainer, the F9F-8T Jet Fighter Procedures Trainer and the H34A Helicopter Trainer. Conducted a research study for the US Naval Training Device Center to determine visual, engineering, and training requirements for wide-angle, non-programmed visual presentations in simulated training environments.

PSYCHOLOGICAL RESEARCH ASSOCIATES (PRA), Arlington, VA, Research Associate: 1954; 1957-1958

Member of a team which conducted a study of Russian mass defection during WWII and made recommendations for operational planning. Member of a team that developed information requirements for decision-making for a proposed Tactical Air Command System. Directed interviews of the 1956 Hungarian Revolution refugees at Camp Kilmer, NJ and collected data on decision-making behavior of revolutionaries,

defectors, and refugees. Member of a team in that developed training for Anti-Submarine Warfare Operations. Member of a team that developed and validated field tests to predict the level of combat effectiveness of Infantry Rifle Squads at Fort Lewis, WA. (The field tests involved day light, night time, and live fire phases. I was responsible for the live fire tests).

PRATT AND WHITNEY AIRCRAFT (PWA), East Hartford, CT Design Engineer: 1956-1957

Trained in the Accelerated Design Engineer Training Program for Engineers sponsored by PWA and received a Design Engineer Certificate from Hillyer College, University of Hartford. I went to work on the J-75 Turbojet Engine at PWA.

UNIVERSITY OF MARYLAND, College Park, MD Graduate Assistant: 1954-1956

Taught laboratory courses in Statistics, Social Psychology, and General Psychology.

U.S. MARINE CORPS, Aug 27, 1946-Aug 5, 1948, USMCR, Oct 2, 1950 -May 14, 1951, Sergeant: Communications..

III. CONSULTANT TO OTHER AGENCIES.

WHITE HOUSE. Organized and participated in the first *Presidential Awards Ceremonies for Outstanding Mathematics and Science Teachers*, (1983).

US CONGRESS, Witness at hearings on Information and Communications Technologies in Education (HR 4326) October 9, 1979; Recorder and resource person Development of Information Technology Education Technology Seminar, Subcommittee on Science, Research and Technology and Subcommittee on Select Education April 2-3, 1980; Provided assistance to Senator Frank Lautenberg of New Jersey for Computer Education in the Schools Legislation, Sept 28, 1983; testimony, *Review of the Status and Trends in Science and Mathematics Education and Human Resources Development* for House Education and Labor Committee, 101 Congress, November 14, 1989.

OFFICE OF TECHNOLOGY ASSESSMENT (OTA), U.S. CONGRESS: I was a Consultant and participant on several studies of information technology in Education: *Informational Technology and its Impact on American Education (1982)*; *Power On: New Tools for Teaching and Learning (1988)* Also see OTA Contract for "Power On" by Charles Blasche, Beverley Hunter, Andrew Zucker "*Support for Educational Technology R&D: The Federal Role*", Educational Turnkey Systems (1987); *Technology and American Economic Transition: Choices for the Future (1988)*; *Linking for Learning: A New Course for Education (1989)*; *OTA Workshop on Distant Learning (1989)*; *Teachers and Technology: Making the Connection (1995)*.

U.S. BUREAU OF THE BUDGET (BOB): Special assignment to conduct a *Feasibility Study of Long-Range Forecasting of Research and Development Requirements for the Federal Government* (1968)

NATIONAL INSTITUTE OF EDUCATION (NIE): U.S. Department of Education: Coordinated NIE/NSF Programs for Cognitive Science and Mathematics and Computers (1980-1983). Reviewed plans of the *Education Technology Center* for the Office of the Assistant Secretary for Educational Research and Improvement (1986).

AGENCY FOR INTERNATIONAL DEVELOPMENT (AID): Chairman of the panel that reviewed Engineering Proposals for the *Program in Science and Technology Cooperation (PSTC) Program for projects in Less Developed Countries* a second panel for *US-Israel Cooperative Development Research Program* (1987, 1989).

ENVIRONMENTAL PROTECTION AGENCY (EPA): Contributed to the *Information Technology Impact Study* (1981) and contributed to the final report, "*Environmental Consequences of Telematics: Telecommunication*,

Computing, and Information Technologies, A Mini Assessment, Coates, Inc. for EPA (May, 1982).

NATIONAL BUREAU OF STANDARDS (NBS): Assisted Dr. Ruth Davis, Director of Computer Science at NBS in preparing "*The United States Response to the United Nations on the Computer Industry and Usage*" (1972). NSF/NBS Minority Institutions Seminars, (May 2, 1986).

NATIONAL INSTITUTES OF HEALTH (NIH): Member of the *Director's Bio-Medical Research Task Force for Increasing Knowledge* (Feb-June, 1969).

DEPARTMENT OF COMMERCE: Participated in the Productivity Steering and Strategic Productivity Task Force (July 16, 1986).

DEPARTMENT OF STATE: Prepared a concept paper for creating a NATO Seminar for Education Technology which was accepted and funded. (1988)

DEFENSE ADVANCED RESEARCH PROJECTS AGENCY (DARPA), Reviewed proposals for the *Computer Aided Education Initiative* (Jan. 24-27, 1995); Joint NSF/DARPA *VLSI Fast turnaround Facility* (1983-1985); NSF/DARPA Educational Computing for DoDEA—Italy, Germany; DARPA/NSF Technology Reinvestment Program; Sponsor and Workshop participant in the NSF/DARPA *New Directions in Human-Computer Interaction: Education, Research and Practice*, (1994).

JOINT DEPARTMENT OF AGRICULTURE, DEPARTMENT OF EDUCATION, NASA AND NSF, *PROJECT IMPACT: Disseminating Innovation in Undergraduate Education: Abstracts of Projects, Things that Work*. National Science Foundation, Arlington, VA (1994). I was a member of the Conference Organizing Committee.

SMITHSONIAN INSTITUTION: Chairman of a Task Force for the review and evaluation of two educational activities 1) *Chesapeake Bay Center for Environmental Studies* 2) *Radiation Biology Laboratory* (1982).

CORPORATION FOR PUBLIC BROADCASTING (CPB): Site visitor for the television and videodisc project and was a Panel Reviewer for *Telecommunications and Undergraduate Education* proposals (1986).

CARNEGIE CORPORATION OF NEW YORK: Participated in the *Planning Meeting for English as a Second Language* (1986).

NEW AMERICAN SCHOOLS DEVELOPMENT CORPORATION, Reviewed proposals (1992).

NEW JERSEY DEPARTMENT OF HIGHER EDUCATION: Chaired the Panel that reviewed University proposals for \$90 million dollar "*Jobs, Science, and Technology*" Bond Issue for creating jobs by supporting High Technology Programs (1986).

MONTGOMERY COUNTY MARYLAND PUBLIC SCHOOLS: Served on the *Science and Computer Curriculum Task Force* (1986-1987).

The IBM LOUIS ROBINSON AWARD. Member of a three person advisory nomination board to select and recommend individuals who over a lifetime have made significant contributions to information technology in teaching and learning. First prize was \$25,000 and \$25,000 in equipment and three other awards for \$10,000 and \$10,000 in equipment (1990 and 1991).

IBM: 1979, 1980, 1983, 1989, Invited lectures on research on computers in education.

IV. TEACHING.

THE AMERICAN UNIVERSITY, Washington, DC. Associate Professor of Research: 1966-1969

Taught graduate courses in *Theory and Methods of Research* in the School of Government and Public Administration and *Dynamics of Revolution*; in the School of International Service and School of Government and Public Administration (1966-1969). Thesis Advisor (1968). Directed research of Graduate Interns.

THE UNIVERSITY OF VIRGINIA, Arlington Virginia Adjunct Professor: 1962-1966

Taught undergraduate courses in General Psychology, Industrial Psychology, and Social Psychology.

V. BUSINESS ACTIVITIES.

MAPLE SPRING FARM (MSF) President: 1983-1993

President of an equestrian riding center. We stabled 40 horses and had approximately 200 students. We specialized in Eventing (dressage, show jumping and cross country jumping) and provided boarding, lessons, clinics by Olympic medalists, horse shows, and summer camp.

VI. AWARDS.

National Educational Computing Association, "*Pioneer in Educational Computing Award*" (1999).

Charles Babbage Institute, Oral History, September 25, 1991, Call No. OH 234. (unedited)

IEEE Archives Oral History, 1991.

Association for Educational Data Systems, "*Outstanding Contribution Award*" for contributions to the field of educational computing (1986)

Presented the *L.C. Essig Distinguished Lecture* at Utah State University, Logan Utah, June 26, 1986.

Quality Increase Award for the Development of an *Intelligent Videodisc Proof-of-concept Test*. (1980).

VII. PUBLICATIONS. I have published 55 articles, 17 reports, 10 chapters in books and co-authored five books. Most can be found under *Andrew R. Molnar* on Google; Amazon.com/books; Education Resources Information Center ERIC/search; <http://InternetArchiveSearch.> "Molnar, Andrew R."; <http://www.LearnTechLib.org> /Andrew R. Molnar; and WorldCat.org.

1. "*The Role of Computers in Education*" Educational Technology (Sept. 30, 1967)

2. Developed an attitude scale, "*Vivisection*", published in Marvin E. Shaw and Jack M. Wright) Scales for the Measurement of Attitudes McGraw Hill, Inc., New York, NY 1967.

3. "*Research and the Undergraduate Curriculum*", in Computers in Undergraduate Education (Ed.) William Viavant, University of Utah (Sept. 1968).

4. "*Research in Computer-Assisted Instruction*", in New York Conference on Instructional Uses of the Computer. A Final Report Board of Cooperative Educational Services, Yorktown Heights, NY (Oct. 1968).

5. "*Educational Technology—The White Elephant*", Educational Broadcasting Review (June, 1969) ERIC ED 027 755

6. "*The Frontiers of Computers in Society*," Analog/Hybrid Computer Educational Users Group Transactions (Sept. 1969).

7. "*U.S. Office of Education Support of Computer Activities*", Educational Technology (April. 1969). ERIC ED 031 959

8. "*Ten Years of Educational Technology*", Educational Broadcasting Review (June, 1969). ERIC EJ 005 320
9. Molnar, Andrew R. and Beverly Sherman, U.S. Office of Education Support of Computer Activities in Education. Government Printing Office, Washington, DC, (1969). 209pp. ERIC ED 031 959
10. Book Review of Anthony Oettinger's "*Run, Computer, Run*" Educational Broadcasting Review, (Feb., 1970).
11. "*Media and Cost-effectiveness*", Analog/Hybrid Computer Educational Users Group Transactions, (Oct. 1970). ERIC ED 044 913.
12. "*Critical Issues in Computer-Based Learning*", Educational Technology (Aug. 1971). ERIC EJ 042 197
13. "*Computer-Based Instruction and the Knowledge Society*" in Computer in Education, (Eds.) Aldo Romano and Sergio Rossi (Bari, Italy: Adriatica Editrice, 1971).
14. "*Higher Education and the Post-Industrial Society*", in Computers in Undergraduate Science Education Conference Proceedings, (Ed.) Ronald Blum, College Park, Md. Commission on College Physics, (1971). ERIC ED 072 648.
15. "*Design of a Course in Social Applications of Computing*". in Proceedings of the Conference on Computers in Undergraduate Curricula, (Dartmouth College, Hanover, N.H. June 23-25, 1971) also appeared in AEDS Monitor, Vol. 13, No.7, Feb 1975.
16. "*The Computer and Curriculum Analysis*", in Educational Yearbook 1971-72 of the British Computer Society, (Ed.) Alan Daniels (29 Portland Place, London, WIN4AP, The British Computer Society, 1971). ERIC ED 041 481
17. "*Perspectives on the Computer in Education*", in Computers and Crisis (Ed.) R.W. Bemer: Association for Computing Machinery, Inc., (New York, NY, 1971).
18. "*Computer Innovations in Education*" an invited paper for the UNESCO International Commission of the Development of Education, Paris, France in Volume 2, *Innovations in Education*, 1972, Also see Edgar Faure et. al. *Learning to be: The World of Education Today and Tomorrow*, Unesco Paris, France, 1972. Also appeared in the ERIC Information Analysis Center for Science, Mathematics, and Environmental Education, The Ohio State University, Columbus, OH 43210 (1973) ERIC ED 077 731, ED 077 211.
19. "*The Computer and the Fourth Revolution*", in the Proceedings of the 11th Annual Convention of the Association for Education Data Systems, 1973. Also appeared in Educational Technologies: Productivity in Higher Education (Eds) Shelley Harrison and Lawrence Stolurow, State University of New York at Stony Brook, New York, 1974. ERIC ED 087 417.
20. "*Directions in National Resource Sharing*", in the Proceedings for Directors of Academic Computing Services, University of Colorado, 1973.
21. "*Viable Goals for New Educational Technology Efforts in Science Education*", Educational Technology, Vol. XV, No 9, Sept. 1975. ERIC EJ 123 028 also <http://www.Learntechlib.org>
22. "*The Use of Computers in Education*", The Journal: Technological Horizons in Education, Vol 3, No 2, Feb. 1976.
23. "*The Delivery Mechanism*", in Instructional Computing in the University: The Second Decade. (Eds.) Julian Feldman and Charles Mosmann. San Francisco: The San Francisco Press, 1977.

24. "*National Policy Toward Technological Innovation and Academic Computing*" The Journal: Technological Horizons in Education, Vol 4, No.6, Sept/Oct 1977, pp.39-43. Also appeared in : Education Tomorrow: Special Studies Division, World Future Society, Vol. III, No.1, Feb 1978.

25. "*The Next Great Crisis in American Education: Computer Literacy*", in the Proceedings of the Society for Applied Learning Technology (SALT), Second International Learning Congress and Exposition, Vol.5, Advanced Learning Technology for Future Education and Training (1978). Also appeared in The Journal: Technological Horizons in Education, Vol.5, No.4, July/August 1978 pp.35-38; Oregon Computer Teacher, Fall Issue, Vol 6, No.1, 1978; Association for Educational Data Systems AEDS Journal, Vol.12, No 1, Dec. 1978; EDUCOM Bulletin, Spring 1979; The Education Digest, Vol. 44, No. 3, Nov. 1978; EDU, Digital Equipment Corporation, Fall 1978; Journal of Educational Technology Systems, Vol. 3, No.7, Jan. 1979; Sperry-Univac Worldwide News, Education, Research, Training, Vol. 79, 040, Blue Bell, Pa 1979, pp31-33; Metropolitan Detroit Science Review, Vol. 41, No.2, 1980; RUN: Computer Education by Dennis O. Harper and James H. Stewart (Eds.) Brooks/Cole Publishing Company, 555 Abrego St., Monterrey, CA. 93940, Oct. 1982. ERIC ED 191 733.

26. "*Computers in the Learning Society*" Proceedings of the Symposium: Human Factors and Computer Science, Catholic University, Washington, D.C. June 1, 1978, Also in Computer Systems Group Newsletter, Vol 6, No.1 , July, 1978.

27. "*Editorial Overview of Papers*", Journal of Educational Technology Systems, Vol 3, No. 7, Jan 1979.

28. "*Intelligent Videodisc and the Learning Society*", Journal Educational Technology Systems, Vol 8 (1), June 1979, also appeared in Journal of Computer-Based Instruction, Vol 6, No 1, pp11-16, Aug 1979; Computing Teacher, Oct-Nov 1979. ERIC EJ 212 751.

29. "*Microcomputer and Computer Literacy: The Catalyst for Educational Change*", The Journal: Technological Horizons in Education, Vol 6, No. 6, Nov 1979.

30. Dorothy K. Deringer and Andrew R. Molnar (Eds.) Technology in Science Education: The Next Ten Years, The National Science Foundation, Washington, DC, 1979. ERIC ED 178 075.

31. "*Understanding How to Use Machines to Work Smarter in an Information Society*", The Journal: Technological Horizons in Education, Vol 7, No. 5, Apr-May 1980, pp. 68-73; Metropolitan Detroit Science Review, Vol 41, No. 3, 1980; RUN: Computer Education, by Dennis O. Harper and James H. Stewart (Eds.), Brooks/Cole Publishing Co., 555 Abrego Street, Monterey, CA, Oct 1982.

32. "*Microcomputers and Videodisc: Innovations of the Second Kind*", Proceedings of the Third International Learning Technology Congress and Exposition, Washington, DC, Feb 27, 1980. Also appeared in The Journal: Technological Horizons in Education, Vol 7, No. 6, Nov. 1980.

33. "*The Coming of Computer Literacy: Are We Prepared For It?*", Educational Technology, Vol 21, No. 1, Jan 1981, pp. 26-28; Also in Proceedings of the Fourth International Congress on Mathematical Education, (Ed.) Marilyn Zweng, Birkhauser Boston, Inc., Boston, MA. 1983, pp. 630-632. ERIC EJ 240 913

34. "*The Challenge of the 1980s; Computer Literacy*", Educational Computer, Feb. 1981.

35. "*Computer Literacy*", Dialogue, International Communications Agency, No.55 (1/1982).

36. Dorothy K. Deringer and Andrew R. Molnar, "*Key Components for National Computer Literacy Program*", in Computer Literacy: Issues and Directions for 1985, Robert J. Seidel, Ronald Anderson and Beverly Hunter, Academic Press, New York, 1982.

37. "*The Search for New Intellectual Technologies*", The Journal: Technological Horizons in Education, Vol 10, No. 1, Sept. 1982. ERIC EJ 267 593.
38. Andrew R. Molnar and Patricia Babb, "*The Electronic Age Challenges Education*", APPALACHIA: Journal of the Appalachian Regional Commission, Vol 16, No.2, pp 1-7, Nov-Dec 1982.
39. "*Computer Literacy: What Next*", The Statewide Computer Literacy Study, Office of Educational Technology and Telecommunications, Alaska State Department of Education, Pouch F, Juneau, Alaska, Jan. 1983.
40. Dorothy K. Deringer, and Andrew R. Molnar, "*University, Industry, Federal Cooperation--A Case Study*", Science, Technology, and Human Values, Vol 8, Fall 1983.
41. Andrew R. Molnar and Dorothy K. Deringer, "*Education: 'Edutainment' How to Laugh and Learn*", IEEE SPECTRUM, pp. 114-118, Jun 1984.
42. "*A Look At The Future of Computers in Science Education*", Disney's Software News, Vol 1, Science/Math Edition, 1986.
43. "*Science, Computers, and Human Resources: A new Challenge for Minority Institutions*" in Issues in Educational Computing in Minority Institutions, (Eds.) Nellouise D. Watkins and William B. De Lauder, Mid-Atlantic Conferences on Educational Computing, Bennett College, Greensboro, NC, 1986.
44. "*Intelligent Tutors and Knowledge-Based Systems in Education*", in the Proceedings of Applications of Artificial Intelligence and Expert Systems, Learning Technology Institute, 50 Culpeper St., Warrenton, Virginia, October 29-31, 1986.
45. "*Applications of Advanced Technologies*", in Technology and Learning, Vol. 1, No. 4, July/August 1987.
46. "*Can Artificial Intelligence Put the Master Teacher in A Computer?*" (Interview), Instruction Delivery Systems, Sept/Oct 1987.
47. "*Education and the 21st Century*", in Teleports and Regional Economic Development. (Eds.) Karen A. Duncan and John R. Ayers, Elsevier Science Publishing Company Inc., 655 Avenue of the Americas, N.Y., N.Y., (1988).
48. "*Information and Communications Technology: Today and in the Future*", in Lifelong Engineering Education, Proceedings from a symposium of the Royal Swedish Academy of Engineering Sciences, IVA Rapport 365, Stockholm, Sweden, 1989.
49. "*Information and Communications Technology: Today and in the Future*", Educational Technology, Vol. 30, No 3, March 1990.
50. "*A Review of the Status and Trends in Science and Mathematics Education and Human Resources Development for the Workforce*", in Hearings on the Status of Education in America and Directions for the Future, Committee on Education and Labor, House of Representatives, 101 Congress, First Session, Washington, DC, November 13, 14, 1989, Serial No. 101-68, US Government Printing Office, Washington, DC 1990 (njlaw.rutgers.edu).
51. "*Computers in Education: A Historical Perspective of the Unfinished Task*", The Journal: Technological Horizons in Education, Vol. 18, No. 4, November 1990, pp80-83.
52. "*Intellectual Tools of the Future*", in The Power of Multimedia: A Guide to Interactive Technology in Education and Business, (Ed.) Joan C. Cash, Interactive Video Industry Association, 800 K St. NW Suite 440,

Washington DC, Oct. 1990. Library of Congress ISBN 1 879109-00-X

53. "*Educational Priorities in a Global Society*", in Annual Meeting Proceedings of the University Council on Water Resources (UCOWR), "Water Issues in an Environmental Era", US Military Academy, West Point, NY, July 30-Aug 3, 1990. Also appeared in the Proceedings of the International Conference on Education and Global Ecology, Pocono Manor, PA sponsored by Technical Education Research Centers, Cambridge, MA, Oct 1990.

54. "*New Paradigms in Classroom Research on Computer-Based Learning and Teaching*" in New Paradigms in Classroom Research on Logo Learning, Eds. Daniel Lynn Watt and Molly Lynn Watt, International Society for Technology in Education, (1993) 1787 Agate Street Eugene, Oregon. ISBN 1-56484-041-7

55. "*Computers in Education: A Brief History*", THE Journal, Vol.24, No, 11, June 1997.

VIII. REPORTS.

1. M. Dean Havron, Andrew R. Molnar, et al. *The Assessment and Prediction of Rifle Squad Effectiveness* (Psychological Research Associates, (PRA), contract for Personnel Research Branch Dept. of the Army, Nov. 1954).

2. *Socio-Psychological Information on Hungarian Refugees, Final report and Intensive Interview Data*, (PRA under contract with Special Operations Research Office (SORO), The American University, 1957).

3. Alexander Askenasy, William Lybrand and Andrew R. Molnar, *An Analysis and Synthesis of Information on Russian Mass Defection during WWII*. (PRA under contract with SORO, The American University, 1957).

4. *Materials and Requirements for Training Echo-ranging Sonobuoy Detection and Classification*. (U.S. Naval Training Device Center, New York, NY, 1958).

5. *Human Engineering Support for Sonobuoy Trainer*. U.S. Naval Training Device Center, New York, NY, 1958.

6. *Requirements for Information In a Proposed Tactical Air Command System*. (U.S. Air Force, 1958).

7. Andrew R. Molnar and W. Lybrand, *Report and Investigation of Wide-angle, Non-programmed, Visual Presentations*. U.S. Naval Training Device Center, New York, NY, 1959. (Volume 1 and Volume 2, Published Ft. Belvoir Defense Technical Information Center, Apr. 1959)

8. E. Bogdanoff, Andrew R. Molnar, et al, *Simulation: An Introduction to a New Technology*. System Development Corporation (SDC), Technical Memorandum TM 499, Santa Monica, CA, March 19, 1960).

9. *Research of Human Information Processes and Decision-Making in a Command and Control System*, SDC, Santa Monica CA, N-LO-1153, Oct 21, 1960.

10. *A Review of and Recommendations for Simulation Research of Man-Computer Decision Problems in Large-Scale Systems*, SDC, Santa Monica, CA, May 15, 1961.

11. Andrew R. Molnar and Adrian H. Jones, *The Use and Evaluation of a Personnel Discriminator in Counterinsurgency*, SORO, The American University, Washington, DC, 1963.

12. *Considerations for a Counterinsurgency Defection Program*. SORO, The American University, 1965

13. Andrew R. Molnar and A. Jones, *Controlling Subversively Manipulated Crowds and Civil Disturbances*, SORO,

The American University, 1965.

14. A. Jones and Andrew R. Molnar, *Internal Defense Against Insurgency: Six Cases*. SORO, The American University, 1966.

15. Andrew R. Molnar, et al, Chaired the *Report of the Education Review Committee for the Chesapeake Bay Center for Environmental Studies and the Radiation Biology Laboratory*, Smithsonian Institution, Washington, DC, 1982.

16. *Science Task Force Report*, Montgomery County Public Schools, Montgomery County, Rockville, Maryland, Mar 29, 1987.

17. *Research on Education Policy and Practice Report: State-of-the-Art Research on Policy and Practice Affecting Technology Used in Education and the Direction NSF Should Follow*, Division of Research, Evaluation and Communications, Directorate for Education and Human Resources, National Science Foundation, Arlington, Va., May 2, 1997.

IX. BOOKS.

1. Andrew R. Molnar, et. al., Undergrounds in Insurgent, Revolutionary, and Resistance Warfare. Special Operations Research Office (SORO) American University, Washington, DC, 1963, 358pp). Three editions were published between 1963 and 1967 and are held in 103 libraries worldwide (World Cat).

2. Andrew R. Molnar, et. al., Human Factors Considerations in Undergrounds in Insurgency (DA PAM 550-104). Special Operations Research Office (SORO) (American University, Washington, DC, 1965, 291pp). 19 editions published between 1965 and 2001 and are held by 243 libraries worldwide (World Cat). Second edition update 2013.

3. G. Tinker, Andrew R. Molnar, and J. LeNoir, Strategies of Revolutionary Warfare (1969, S. Chand and Co. New Delhi, 382pp).

4. Adrian Jones and Andrew R. Molnar, Internal Defense Against Insurgency: Six Cases. Special Operations Research Office, The American University, 1966. Four editions were published between 1966 and 1967 and are held in 29 libraries worldwide (World Cat).

5. Andrew R. Molnar and Beverly Sherman, U.S. Office of Education Support of Computer Activities. U.S. Government Printing Office, Washington, DC 1969. Six Editions published in 1969 and are held in 103 libraries worldwide. 210 pp, (World Cat)

X. PROFESSIONAL ACTIVITIES.

1. Served on the Conference Committee and refereed papers for the Conference on Computers in the Undergraduate Curricula (CCUC) 1973-1978.

2. Served on the Symposium Committee and refereed papers for the Fifth Special Interest Group for Computer Science Education (SIGCSE) Symposium, Washington DC 1975.

3. Peer Reviewed Papers for Science, ERIC, Science 84, IEEE SPECTRUM, IEEE Transactions of Education.

4. Contributing Editor for The Journal: Technological Horizons in Education. (1976-1997).

5. Contributing Editor for Technology and Learning. Lawrence Erlbaum Associates Inc., Publishers (1986-

1990).

6. Contributing Editor for Education & Computing: The International Journal, Elsevier Science Publishers, Amsterdam, The Netherlands, (1989-1992).

7. Member of the Steering Committee for the Society for Applied Learning Technology Conference (1977-78).

8. Served on the Symposium Committee that refereed Papers for the National Education Computing Conference (NECC), (1981-1991).

XI. INTERVIEWS.

I have been interviewed or cited by many journals some of which are:

The New York Times, Time Magazine, Newsweek, OMNI, Wall Street Journal, Business Week, Good Housekeeping, Washington Post, Christian Science Monitor, Higher Education Daily, Chronicle for Higher Education, Houston Chronicle, Minneapolis Star, Educational Technology, Medill News Service, American Way-American Airlines, Science, Science News, Sky:Delta Airlines, Walt Disney's Software News.

XII. RADIO, TELEVISION AND TELECOMMUNICATION.

1. Interviewed by Phoenix, Arizona Television Station on Computer Literacy, January 16, 1981.

2. Interviewed for a Radio Public Service Series, "Rewiring Your World", with Martin Agronsky, A Public Affairs Television and Radio Series that examines the communications revolution with 17 experts. Produced by the Communications Workers of America (CWA), Oct 1, 1981. The broadcast aired on 500 public radio stations during the month of February.

3. Interviewed by Mr. Philip Walters of WBBM-TV Chicago for a series on *Computers in Society*, Jan 18, 1982.

4. Interviewed by Curt McNamara for Station KFAI Minneapolis, MN and National Public Radio, a five minute segment of a 3 ½ hour program on *Computers in Education*, July 19, 1982.

5. Participated as an invited Panelist on "*Computer Literacy*" at the "*Uses of Microcomputers in Education Conference*" Ohio State University. This Satellite Video Conference as viewed in the United States and Canada by an audience of 7,000, October 29, 1982.

6. Appeared on the Phil Donahue Show: Donahue The Last Word, (National Television) to discuss "*Computers in Education*", Chicago, IL, Feb 3 1983.

7. Appeared on The Phil Donahue Show, (National Television) to discuss "*Computers and Robotics in Education*", April 5, 1983.

8. Interviewed by Joe Menosky on National Public Radio on "*Computers in Society and Computer Literacy*", May 19, 1983.

9. Interviewed by Blake Mendenhall or KBLX Radio, San Francisco for "*Insight--a program on Computers in Society*". 1983.

10. Keynote Address, "*Instructional Computing: The Future is Today*", Association for Indiana Media Education, Indianapolis, IN (Teleconference), Mar 10, 1983. (Teleconference, estimated 700 in attendance).

11. Interviewed by Montana Mountain Television News Network for Statewide Television on "*Computers in*

Education", June 23, 1983.

12. Interviewed by Gloria Goodele for the Christian Science Monitor Radio (300 Station Network) as a follow-up to a newspaper interview on "*Gender Differences and the Use of the Computer*", July 21, 1983.

13. Video Interview by Harry Reasoner, CBS News- 60 Minutes, on "*Computers in Education*", Sept 8, 1983.

14. Appeared participating in *Presidential Awards for Excellence in Science and Mathematics Teaching*, East Room of the White House, Washington, DC, Channel 11, Baltimore, MD, Oct 19, 1983.

15. Interviewed by Rudy Maxa on the Ron Eiseberg Radio Show on "*Technophobia*", WRC Washington, DC (60 minute interview) Dec 19, 1983.

16. Held a Press Conference at Howard County School Board on "*High Technology and Education*" and appeared on Channel 8 cable television, Columbia, MD, Mar 2, 1984.

17. Interviewed by Marvin Druger on computers in education for station WJPZ Syracuse NY, Dec 9, 1985.

18. Invited speaker at a teleconference on "*Educational Technology: What the Future Holds*" and question and answer session chaired by Utah State University for twenty colleges in Utah, Idaho, Wyoming, Montana and Canada, Feb 12, 1987.

19. Interviewed by National Public Radio (NPR), "*Technology and Education for America's Culturally and Linguistically Diverse Populations*", at Howard University, Washington, DC, Mar 28, 1989.

20. Interviewed on television for the *Mind Expansion University for the Educational Technology Leadership Program*, George Washington University, Washington DC January 26, 1994.

XIII. INVITED SPEECHES AND CONFERENCES.

I have made over 219 major speeches and presentations, including 26 Keynote addresses and 11 featured speeches. I have made invited presentations in France, Italy, Austria, the Netherlands and Sweden. I have made invited speeches at the National Academy of Sciences, The Royal Swedish Academy of Engineering Science, The Bulgarian Academy of Sciences, The Organization of Economic Cooperation and Development, Center for Educational Research and Innovation, and meetings sponsored by IBM Europe, the World Bank, IBM, Apple Corporation, Hewlett-Packard, Fututake, the Defense Manufacturing Board of the US Department Defense, and the US Congress and the White House. I have held invited seminars at Yale University, the University of Illinois, Utah State University, the University of Maryland, and George Washington University. I have also made an invited presentation before the *Virginia Governor's Commission for the Year 2000*.

1. Participant in the *Symposium on Simulation and Simulation of Decision Systems*, MITRE Corporation, Bedford, MA, Jan. 1962.

2. Presented a paper, "*The Use of a Personnel Discriminator in Counterinsurgency*", at the Symposium on the "Uses of a Personnel Discriminator", Limited War Laboratory, Aberdeen, MD, July 17, 1963.

3. Presented a paper, "*The Cause in Insurgency*", at the 13th Annual Military Operations Research Symposium (MORS), at the Industrial War College, Fort McNair, Washington, DC, April 28-29, 1964.

4. Presented a lecture, "*The Psychology of Crowd Behavior*", The International Police Academy, Washington, DC, Feb 19, 1965.

5. Participant in "*Social Sciences Information Systems Workshop*" sponsored the Center for Research in Social Systems and System Development Corporation, Airlie Foundation, Warrenton, VA, May 1966.
6. Presented a paper, "*Computers in Education*", at the Association for Educational Data Systems, Detroit, MI, May 1967.
7. Participated in the *Conference on Computers and Humanistic Studies*, sponsored by the Interuniversity Communications Council (EDUCOM) and the National Endowment for the Humanities, Pocono Manor Inn, PA, June 8-10, 1967.
8. Presented a paper "*New Educational Media*", at the 22nd Meeting of Educational Media Council, Washington, DC, June 1967.
9. Presented a paper, "*The Frontiers of Computers in Society*", at the Spring Joint Computer Conference of the American Federation of Information Processing Societies, Atlantic City, NJ, May 2, 1968.
10. Presented a paper, "*Educational Media: The White Elephant*", at the 23rd Meeting of the Educational Media Council., Washington DC, (ED 027 755) June 10, 1968.
11. Presented a paper, "*Research and the Undergraduate Curriculum*" at the National Science Foundation's Park City Conference on *Computers in Undergraduate Education*, Salt Lake City, UT, Sept 10, 1968.
12. Presented a lecture, "*Systems Analysis and Education*", at the Smithsonian Institution's Belmont Conference for Postdoctoral Fellows, Elkridge, MD, Sept 18, 1968.
13. Presented a paper, "*Research and Computer-Assisted Instruction*" at the State Education Department of New York and the Board of Cooperative Educational Services, *Computer-Assisted Instruction Conference*, Sterling Forest Conference Center, Tuxedo, NY, Oct 3-5, 1968.
14. Chairman of a Panel, "*The Status and Future of Instructional Technology*", at the National Association of Educational Broadcasters' Annual Convention, Washington, DC, Nov 22, 1968.
15. Chairman of a "*Research Conference on the Future of Higher Education*", U.S. Office of Education, Washington, DC, Dec 2-3, 1968.
16. Participant in the *National Conference on Telecommunications Policy and Education* and Co-Chairman of the Commission on the University and Inter-institutional Cooperation, University of Georgia, Athens, GA, Dec 4-6, 1968.
17. Keynote Address, "*Educational Systems Without Boundaries*", The Association for Educational Data Systems Seventh Annual Convention, Portland, OR, May 6-9, 1969.
18. Presented a paper, "*Higher Education: The Problem and the Challenge*", at the Human Factors Society, Potomac Chapter, Annual Symposium, Silver Spring, MD, May 15, 1969.
19. Presented a lecture, "*Impact of Computers on Higher Education*", at the Wisconsin Computing Utility, Summer Institute, University of Wisconsin at Milwaukee, WI, Aug 18, 1969.
20. The U.S. Representative to the *International Conference on Computers in Education*, at the Organization for

Economic Co-Operation and Development, Centre for Educational Research and Innovation, Paris, France, September 25-26, 1969.

21. Chairman of a panel, "*Research on Instructional Systems*", at the National Association of Educational Broadcasters' Annual Convention, Washington, DC, Nov 11, 1969.

22. The U.S. Representative and a participant in "*The Seminar on Computer Sciences in Secondary Education*", organized by the Organization for Economic Co-Operation and Development, Centre for Educational Research and Innovation in collaboration with the French Government, at the Centre International d'Etudes Pedagogiques, Sevres, France, Mar 9-14, 1970.

23. Participated in the "*Consultation on Computer-Assisted Instruction*", at the United Nations Educational, Scientific and Cultural Organization (UNESCO) in Paris, France, Mar 16-18, 1970.

24. Chairman of the "*Curriculum Analysis Seminar*" and presented a paper "*The Computer and Curriculum Analysis*", at the *Conference on the Use of Computers in Higher Education* at the Organization for Economic Co-Operation and Development, Centre for Educational Research and Innovation, Paris, France, Mar 19-21, 1970 (ED-041-481).

25. Invited participant for the "*Educational Technology, Strategies for Implementation Conference*", a workshop organized by the Centre for Educational Research and Innovation (CERI) in collaboration with the Government of the Netherlands, Leiden, Netherlands, Apr 19-25, 1970. Also see the report, *Educational Technology: The Design and Implementation of Learning Systems*, Organization for Economic Co-operation and Development (OECD), 2, rue Andre-Pascal, Paris, France, 1971

26. Presented a paper and was a panelist for the "*Seminar on Media Cost-Effectiveness*", the the National Education Association, Department of Audiovisual Instruction National Convention, Detroit, MI, Apr 27-May 1, 1970 (ED-044-913).

27. Participated in "*Trends in Instructional Technology Conference*", sponsored by the Stanford ERIC Clearinghouse on Educational Media and Technology, Washington, DC, May 15, 1970.

28. Invited paper, "*A perspective on Educational Technology*", at the Joint Council on Education Telecommunications Meeting, Washington, DC, Jul 20, 1970.

29. Invited paper "*Higher Education and the Post-Industrial Society*", at the *Conference on Computers in College Science* sponsored by the Commission on College Physics and the Illinois Institute of Technology, Chicago, IL, Aug 17-21, 1970.

30. Chairman and Moderator of the panel, "*Perspectives on the Future of Computers in Education*", at the Association for Computing Machinery 25th National Conference, New York, NY, Sept 1-3, 1970.

31. Invited paper, "*Computer-Based Instruction and the Knowledge Society*", at the Computer in Education Conference at the Centro Studi E Applicazioni in Tecnologie Avanzate, Universita Deli Studi Di Bari, Bari, Italy, Oct 1-3, 1970.

32. Invited paper "*Critical Issues in Computer-Based Learning*" at the *National Association of Users of Computer Applications to Learning (NAUCAL)* Invitational Conference, Washington, DC, Nov 11, 1970.

33. Chairman of the Panel, "*Design of Instructional Systems*", at the 11th Annual Institute of Electrical and Electronics Engineers, (IEEE) *Man-Machine Systems Symposium*, Winter Park, FL, Nov 13, 1970.

34. Invited address, "*The Future of Educational Technology: Research and Development*" at the *Joint Session with Special Interest Groups on Educational Technology* at the Annual American Educational Research Association Meeting, New York, NY, Feb 4, 1971 (ED-054-642).
35. Presented a paper, "*Systems Applications in Higher Education: Implications for Research and Development*", Symposium at the Annual American Educational Research Association Meeting, New York, NY, Feb 7, 1971 (ERIC ED-054-642).
36. Invited address, "*The Computer, Higher Education, and the Knowledge Society*", at the *League for Innovation in the Community College-IBM Conference on The Use of the Computer As An Aid to Instruction*, San Jose, CA, Jun 3, 1971.
37. Chairman of a panel and presented a paper, "*Design of a Course in Social Applications of Computing*", at the *Conference on Computers in the Undergraduate Curricula*, Dartmouth College, Hanover, NH, Jun 24, 1971.
38. Panelist at the "*Seminar on Standards for Educational Equipment*", sponsored by the *Educational Media Council and the Bureau of Libraries and Educational Technology* of the U.S. Office of Education, Washington, DC, Nov 11-12, 1971. Library of Congress No. 72-96298
39. Workshop Leader, "*Computer Innovations in Education*", at the Second Annual National Educational Technology Conference, New York, NY, Mar 21, 1972.
40. Discussant on the panel, "*Computer-Based Advanced Instructional System for Technical Training and Evaluation*", at the Annual American Educational Research Association Meeting, Chicago, IL, Apr 5, 1972.
41. Invited address, "*Computer in Research and Education*", for the California Educational Computing Consortium (CECC) and the California Educational Data Processing Association (CEDPA) Annual Meeting, Palo Alto, CA, Dec 7, 1972.
42. Feathered Speaker, "*Communicating in the Future*", for the Washington Chapter of the Society for Technical Communication, Beltsville, MD, Feb 20, 1973.
43. Invited paper, "*The Computer and the Fourth Revolution*", at the Annual Convention of the Association for Educational Data Systems, New Orleans, LA, Apr 17, 1973 (ED 087-417).
44. Chairman of a panel, "*Pedagogy and Computer Courseware--Theory and Practice*", at the Fourth Conference on Computers in the Undergraduate Curricula at Claremont Colleges, Claremont, CA, Jun 19, 1973.
45. Participant in "*The National Conference on the K-12 Mathematics Curriculum*", Snowmass, CO, Jun 21-24, 1973.
46. Presented an invited paper, "*Computer-Based Instruction: Old Myths and New Realities*" at the Association for the Development of Computer-Based Instructional Systems (ADCIS) Conference at the University of Michigan, Ann Arbor, MI, Aug 8, 1973.
47. Invited paper, "*Directions in National Resource Sharing*", at the Fourth Annual Seminar for Directors of Academic Computing Services at Snowmass, CO, Aug 21, 1973.
48. Discussant at "*The Education Technology Symposium*", at the State University of New York at Stony Brook, NY, Sept 23-26, 1973.

49. Invited speech, "*New Technology*", at the 33rd Meeting of the Educational Media Council, Washington, DC, Nov 29, 1973.
50. Invited speech, "*NSF and Technological Innovations*", University of Pennsylvania School Study Council, U.S. Office of Education, Washington, DC, Nov 29, 1973.
51. Invited speech, "*Education and Technological Innovations*", University of Pennsylvania, Graduate School for Education, Center for School Study Councils, U.S. Office of Education, Washington, DC, Feb 1, 1974.
52. Invited speech, "*Television and Science Education*", National Association of Educational Broadcasters Seminar at the Brookings Institution, Washington, DC, Apr 8, 1974.
53. Invited speech, "*Educational Technology*", Association for Educational Data Systems, New York, NY, May 9, 1974.
54. Invited Panelist, "*Computers and Calculus*", at the Joint Meeting of the American Mathematical Society and the Mathematical Association of America, Washington, DC, Jan 21, 1975.
55. Invited paper, "*Viable Goals for New Educational Technology Efforts: Science Education and the New Technology Revolution*", at the 141st Annual Meeting of the American Association for the Advancement of Science (AAAS), New York, NY, Jan 30, 1975.
56. Invited Panelist and Reactor for the speech, "*Humans in the Universe*", by R. Buckminster Fuller, Distinguished University Professor, Southern Illinois University at the *Second National Symposium for Anticipating Tomorrow's School: Education of the Future*, sponsored by Research for Better Schools, Inc., Philadelphia, PA, Feb 7-9, 1975.
57. Invited paper, "*The Economics of Educational Technology: A Federal Viewpoint*", at the Symposium on Applied Learning Systems Curriculum Requirements: sponsored by the American University and the Society for Applied Learning Technology at the American University, Washington, DC, Mar 11-12, 1975.
58. Invited speech, "*The Delivery Mechanism*", for the Second Decade: A Conference on Computing in the University, University of California, Irvine, CA, Mar 20-21, 1975.
59. Panel Chairman, "*Federal R&D Programs*", at the Ten-Year Forecast for Computers and Communications: Implications for Education Conference, Airlie House, VA, Sept 17, 1975.
60. Participated in the "*Diffusion of Innovations and Technology Transfer*" Session and Chaired the "*Technological Innovation in Education*" Session at the "Project Directors' Meeting, National Science Foundation, Airlie House, VA, Jan 11-13, 1976.
61. Invited speech, "*Conference on Hand-Held Calculators*", sponsored by The National Institute of Education and the National Science Foundation, Arlington, VA, Jun 27, 1976.
62. Invited paper, "*The New Intellectual Technology*", at the 6th Congress of the International Ergonomics Association, University of Maryland, College Park, MD, July 12, 1976.
63. Panel discussant, "*Cost-Effectiveness in the Application of Learning Technology to Minorities and the Handicapped*", at the First International Learning Technology Congress and Exposition sponsored by the Society for Applied Learning Technology, Washington, DC, July 23, 1976.

64. Invited speech "*NSF Program in Computer Science*", at the Association of Computing Machinery (ACM) Special Interest Group on Computer Science Education (SIGCSE), Sixth Technical Symposium of Computer Science Education, Williamsburg, VA, July 26, 1976.
65. Invited speech "*National Approaches to Research and Development in Computer Applications to Learning*", at the National Association of Uses of Computer Applications to Learning (NAUCAL) Conference, Portland, OR, Oct 29, 1976.
66. Invited speech "*Computers in Education*", at the Washington, Annapolis, Baltimore Area (WABA) Symposium at the U.S. Naval Academy, Annapolis, MD, May 18, 1977.
67. Featured Speech, "*Futures in Computer Education*", Sixth Annual National Association of Uses of Computer Applications to Learning (NAUCAL) Convention, Dearborn, MI, Nov 4, 1977.
68. Invited speech, "*The Next Great Crisis in American Education: Computer Literacy*", at the Society for Applied Learning Technology, Second International Learning Technology Congress and Exposition, Orlando, FL, Feb 16, 1978.
69. Keynote address, "*The Computer and the Learning Society*". at the Human Factors and Computer Science Symposium, sponsored by the Potomac Chapter of the Human Factors Society and Technical Interest Group-Computer Systems, Catholic University, Washington, DC, Jun 1, 1978.
70. Keynote address, "*The Uncertain Role of Education in the Knowledge Society*", at the Maryland Association for Educational Uses of Computers (MAEUC), Towson State University, Baltimore, MD, Nov 16, 1978.
71. Invited speech, "*Teaching About Computers*", at the Association for Computing Machinery Elementary and Secondary Schools Committee Meeting, Washington, DC, Dec 2, 1978.
72. Panel Chairman, "*Report on the ACM/NSF Workshop on Computers and Society and Computer Literacy*", at the Association for Computing Machinery (ACM) Annual Meeting, Washington, DC, Dec 6, 1978.
73. Invited paper, "*Intelligent Videodisc and the Learning Society*", National Conference of the Association for the Development of Computer-Based Instructional Systems, San Diego, CA, Feb 27, 1979.
74. Invited speech "*Computers: A National Perspective*", at the Lamplighter Workshop, Massachusetts Institute of Technology, Cambridge, MA, Aug 9 1979.
75. Invited witness for Hearings on "*Information and Communication Technologies in Education*" (H.R. 4326, a bill to establish a National Commission to Study Scientific and Technological Implications of Information Technology in Education) Committees on Science and Technology and Education and Labor, U.S. House of Representatives, Washington, DC, Oct 9, 1979.
76. Invited speech, "*Computer Literacy--The Educational Imperative*", Annual Conference of the Virginia Educational Media Association, Virginia Polytechnic Institute and State University at Blacksburg, VA, Oct 26, 1979.
77. Invited speech, "*Understanding How to Use Machines to Work Smarter in an Information Society*", at the Conference on Microcomputers in Education, Harvard Graduate School of Education, Cambridge, MA, Nov 29-30, 1979.

78. Invited speech, "*Microcomputing for Decision-Makers*", *Micro-Computer Symposium for Decision-Makers*" sponsored by the Intermediate School Districts of Macomb, Oakland, and Wayne Counties, Dearborn, MI, Dec 5, 1979.
79. Invited paper, "*Microcomputer and Videodisc*", Third International Learning Technology Congress and Exposition, sponsored by the Society for Applied Learning Technology., Washington, DC, Feb 27, 1980.
80. Provided assistance for Congressman George Brown, JR of California and Congressman Paul Simon. I helped plan and participated as recorder and resource person for the discussion group on Development of Information Technology at the "*Information Technology in Education Seminar*", sponsored by the Committee on Science and Technology and the Committee on Education and Labor of the U.S. House of Representatives, the Rayburn House Office Building, Washington, DC, Apr 2-3, 1980.
81. Invited speech, "*Technology in Science Education*", National Association for Research in Science Teaching (NARST), Boston, MA, Apr 12, 1980.
82. Invited paper, "*The Coming of Computer Literacy: Evolution or Revolution* ", 4th International Congress on Mathematical Education, University of California-Berkeley, CA, Aug 12, 1980.
83. Invited participant in the "*Information Technology and Education Study Planning Workshop*" sponsored by Telecommunications and Information Systems, Office of Technology Assessment, Congress of the United States, Washington, DC, Sept 8, 1980.
84. Presented a paper, "*Computer Literacy*", at the *Conference on National Goals for Computer Literacy* in 1985 sponsored by Human Resources Research Organization, Reston, VA, Dec 18-20, 1980.
85. Keynote address, "*The Challenge of the 1980's: Computer Literacy*", at the Ninth Annual Math/Science Conference: Microcomputers in Education, Arizona State University, Tempe, AZ, Jan 16, 1981.
86. Presented a workshop, "*Research Avenues for Microcomputers in Education*", at the Ninth Annual Math/Science Conference: Microcomputers in Education, Arizona State University, Tempe, AZ, Jan 16, 1981.
87. Invited participant, "*Communications and Information Technologies Workshop*", sponsored by the Office of Technology Assessment, Congress of the United States, Washington, DC, Jan 22, 1981.
88. Chaired Sessions, "*Continuing Education for Engineers and Scientists*" and "*Videodisc and Television*" at the Science Education Development and Research Project Directors' Meeting, Washington, DC, Feb 5-7, 1981.
89. Presented a paper, "*Technologies in Instructional Delivery Systems for the 80s*", Society for Applied Learning Technology Conference, Orlando, FL, Feb 11-12, 1981.
90. Invited participant at the "*Environmental Consequences of Developing Telecommunications Technology Workshop*", sponsored by the Environmental Protection Agency, Washington, DC, Feb 24, 1981.
91. Invited speaker, "*The Need for Computer Literacy*", at the Planning for Computer Literacy in Schools; an invitational workshop for school system policy makers and executives, Rockville, MD, Mar 25, 1981.
92. Invited speech, "*The Next Great Crisis in American Education: Computer Literacy*", Meeting of Administrative and Supervisory Staff of the Montgomery County Public Schools, Rockville, MD, May 13, 1981.
93. Participated in the "*Congressional Operations Institute Seminar*", sponsored by the U.S. Office of Personnel

Management held at the U.S. Senate and House of Representative, Washington, DC, Jul 27-31, 1981.

94. Keynote address, "*Computer Literacy*", Annual Mathematics In-service Program, Fairfax Public Schools (Hayfield Secondary School and South Lakes High School), Fairfax, VA, Sept 3, 1981.

95. Keynote address, "*Research on Computers, Television, and Intelligent Videodisc*", Second National Videodisc Symposium, University of Nebraska, Lincoln, NE, Oct 21, 1981.

96. Invited presentation, "*International Technology Developments: USA*", International Seminar on Technology, U.S. Department of Education and the Center for Educational Research and Innovation, Organization for Economic Co-operation and Development, Washington, DC, Jun 21, 1982.

97. Invited panelist, "*Computer Literacy: Definitions, Purposes, and Strategies for Success*", Fourth General Assembly of the World Future Society, Washington, DC, Jul 19, 1982.

98. Keynote address, "*Making Computers Count Instead of Counting Computers: Research Findings, Educational and Policy Implications*", Conference of Instructional uses of Microcomputers sponsored by the Virginia Department of Education and APPALACHIA Education, Roanoke, VA, Sept 20, 1982.

99. Featured Luncheon address, "*Computer Education: Everything Has Changed But Our Thinking*", EDCOM '82 Conference, Los Angeles Convention Center, Los Angeles, CA, Oct 22, 1982.

100. Invited panelist, "*Coming or Going--What Does the Future Hold?*", EDCOM '82 Conference, Los Angeles, CA, Oct 23, 1982.

101. Invited panelist, "*Computer Literacy*", at the *Uses of Microcomputers in Education Conference*, Ohio State University, Columbus, OH. (This was a satellite teleconference with 15 interactive university sites participating with an audience of 7,000) Oct 29, 1982.

102. Featured speaker for a graduate and faculty seminar, "*Computers are Changing, Why not Education?*" Department of Education, University of Maryland, College Park, MD, Nov 30, 1982.

103. Keynote address, "*Computer Literacy: What Next*", Alaska Computer Literacy Statewide Planning Conference, sponsored by the Alaska State Department of Education, Anchorage, AK, Dec 13, 1982.

104. Invited presentation and demonstration, "*Intelligent Videodisc Technology*", Commission on Precollege Science, Mathematics, and Technology, Washington, DC, Jan 14, 1983.

105. Invited speech, "*Technology: The Museum Educator's Role--Teacher or Technician?*", Museum Education Roundtable, National Museum of American History, Washington, DC, Feb 17, 1983.

106. Invited speech, "*Moving Technology into the Classroom*", Technology Transfer Society Meeting, U.S. Conference of Mayors, Washington, DC, Feb 17, 1983.

107. Keynote address, "*Instructional Computing: The Future is Today*", Association for Indiana Media Education, Indianapolis, IN, Mar 10, 1983 (Teleconference).

108. Featured speech, "*Computing in Society: Educational Implications for the Future*", American Association of University Women Meeting, Silver Spring, MD, Mar 21, 1983.

109. Keynote address, "*Instructional Use of Computers in Post-secondary Education*", Capital Area School

Development Association, State University of New York, Albany, NY, Mar 25, 1983.

110. Invited special address, "*Future of Technology in Education: What Next?*" Florida Instructional Computing Conference sponsored by the Florida Department of Education, Tampa, FL, Mar 30 1983.

111. Invited speech, "*Research in Science Education*", Post-secondary Educational Technology Conference sponsored by the National Center for Educational Statistics, U.S. Department of Education and the Center for Telecommunications, The George Washington University, Washington, DC, Mar 31, 1983 (Teleconference).

112. Invited speech, "*Computers in Schools: Asset or Liability?*", Council for Basic Education Conference on Math and Science: Where are the Teachers?, Washington, DC, Apr 15, 1983.

113. Invited lecture, "*Computers in Society*", Computer Science Department, University of Maryland, College Park, MD, May 2, 1983.

114. Keynote address, "*The Computer Literacy Crisis Revisited*" Association for Computing Machinery (ACM) SIGCUE/SIGCAS Computer Literacy Symposium, National Education Computing Conference, Baltimore, MD, Jun 5, 1983.

115. Keynote address, "*Computers in Education*", State Leadership Assistance for Technology Education (SLATE) Conference, State of Montana, Carrol College, Helena, MT, Jun 23-24, 1983.

116. Working session with Governor Ted Schwinden on improving teacher education at the State Leadership Assistance for Technology Education (SLATE) Conference, Helena, MT, Jun 23-24, 1983.

117. Invited address, "*Educational Policy: Making Computers Count Rather Than Counting Computers*", Computer in Education '83 Conference, Rutgers, The State University of New Jersey, New Brunswick, NJ, Jun 28, 1983.

118. Invited speech, "*Factors Affecting Innovation: Working Now and in the Future*", World Future Society Meeting, Washington, DC, Aug 11, 1983.

119. Invited speech, "*Cognitive Science*", for the Psychology Delegation from the Chinese Academy of Sciences, sponsored by the National Academy of Sciences, National Research Council, Commission on Behavioral and Social Sciences and Education, Washington, DC, Sept 6, 1983.

120. Invited speech, "*Science, Mathematics, and Technology and the Commission Reports*", World Future Society, Washington Chapter, Washington, DC, Sept 20, 1983.

121. Provided assistance to Senator Frank R. Lautenberg of New Jersey for *Computer Education in the Schools* legislation Washington, DC, Sept 28, 1983.

122. Participated in the ceremony for the *Presidential Awards for Excellence in Science and Mathematics Teaching*, The White House, Washington, DC, Oct 19, 1983.

123. Keynote address, "*Computing and Schools of Education: Lead, Follow, or Stand Aside*", Computers in Education Conference, North Texas State University, Denton, TX, Oct 27, 1983.

124. Invited speech, "*Policy Initiatives to Meet a High Technology Future*", Education, Public Policy and the Reagan Administration: A National Conference on Educational Issues sponsored by Harvard Educational Review, Institute for Educational Leadership, Inc, and the Bureau of National Affairs, Inc, Washington, DC, Nov 22, 1983.

125. Invited presentation, "*The Future for Year 2000*", Education Task Force for Governor Charles Robb's *Commission on Virginia's Future*, State Capitol, Richmond, VA, Dec 1, 1983.
126. Keynote address, "*Trends in Technology and Their Implication for Educational Policy*", Nebraska Conference on Educational Technology sponsored by the University of Nebraska, Nebraska State Department of Education, and the Governor's Policy Research Office, University of Nebraska, Lincoln, NE, Feb 19, 1984.
127. Keynote address, "*State-of-the-Art: Educational Technology*", Mid-Atlantic Conference on Educational Computing, sponsored by the Minority Institutions Science Improvement Program, Department of Education and the North Carolina A & T State University and Bennett College, Greensboro, NC, Mar 6, 1984.
128. Keynote Address, "*High Technology and Education*", The Forum for the Future: The Alliance of High Technology and Education, sponsored by the Board of Education for Howard County, Columbia, MD, Mar 23, 1984.
129. Featured address, "*High Technology in Education*", *A World of Technology Conference*, University of Maryland, College Park, MD, Apr 27, 1984.
130. Beverly Hunter and Andrew Molnar, Invited debate, "*The Need for Computer Literacy in Schools is Greater than Ever Before*", Association for Computing Machinery SIGCAS/SIGCUE at the Computer Literacy Symposium, Dayton, OH, Jun 12, 1984.
131. Invited speech, "*Special Education Technology Research and Development*", at the Special Education Technology R & D Symposium sponsored by the National Association of State Directors of Special Education in conjunction with Gallaudet College, Washington, DC, Jun 19, 1984.
132. Member of the United States Delegation to the "*International Conference on Education and New Information Technologies*", sponsored by the Organization of Economic Co-operation and Development, Centre for Educational Research and Innovation, Chateau de la Muette, Paris, France, Jul 9-12, 1984.
133. Invited speech, "*Technology in Science Education: The Next Ten Years*", Fourth Annual Texas Conference on Technology and Education, University of Texas at Austin, TX, Jul 19, 1984.
134. Invited speech, "*The Fifth Generation Challenge*", Association for Computing Machinery, San Francisco, CA, Oct 10, 1984.
135. Panelist, "*The School of the Future*", Vanderbilt University and IBM, Nashville, TN, Nov 10, 1984.
136. Keynote address, "*Computers: The New Educational Imperative*", Bank Street College Conference on Computers, New York, NY, Feb 1-2, 1985.
137. Invited speech, "*The Child and the Computer*", 15th Annual Early Childhood Conference, University of Maryland, College Park, MD, Mar 5, 1985.
138. Testified before the Department of Education *Committee for the National Task Force on Educational Technology* formed by Secretary Terrel Bell, Washington, DC, Mar 6, 1985.
139. Participated as expert consultant for the "*Computer-Use-In-Education*" project sponsored by the National Commission for Employment Policy, Delphic Seminars, Alexandria, VA, Mar 1985.

140. Participant in the Office of Technology Assessment, U.S. Congress project on "*Technology and the American Economics Transition*", Urban Institute, Delphic Seminar, Washington, DC, Mar 1985.
141. Invited speech, "*Technology: A New Significant Factor in the Equity Equation*", American Association for the Advancement of Science Annual Meeting, Los Angeles, CA, May 27, 1985.
142. Invited speech, "*The Promise of Educational Technology*", Electronic Delivery System and Engineering Education Panel, American Association for the Advancement of Science, Los Angeles, CA, May 30, 1985.
143. Invited speech, "*Instructional Materials Development*", Educational Technology Seminar, IBM Europe Institute, Oberlech, Austria, Jul 15-19, 1985.
144. Invited speech, "*National Science Foundation and Educational Technology: A Historical Perspective*", World Conference on Computers in Education, Norfolk, VA, Jul 30, 1985.
145. Keynote address, "*Mathematics Education*", Maryland Council of Teachers of Mathematics and Maryland School-College Mathematics Association Annual Conference, Baltimore, MD, Oct 18, 1985.
146. Invited speech, "*Computers and Education--A Look to the Future*", Conference on Computers and Education sponsored by the Association for Computing Machinery, Towson State University, Baltimore, MD, Oct 26, 1985.
147. Discussant at the "*Conference on Computers and Complex Thinking*", sponsored by the Wisconsin Center for Educational Research and the National Academy of Sciences, Washington, DC, Oct 31, 1985.
148. Keynote address, "*Computers and Education*", Pennsylvania Association of Graduate Schools, Lehigh University, Bethlehem, PA, Apr 2, 1986.
149. Acceptance speech on receiving the *Outstanding Contribution Award* of the Association for Educational Data Systems, New Orleans, LA, Apr 22, 1986.
150. Speech, "*Applications of Advanced Technologies*", National Bureau of Standards and National Science Foundation Seminar for Faculty of Minority Institutions, Washington, DC, May 2, 1986.
151. Participant in the Carnegie Corporation of New York Seminar "*Using Computers to Promote the Development of English as a Second Language*", Carnegie Corporation, New York, NY, Jun 2, 1986.
152. Presented the L.C. Essig Distinguished Lecture, Summer 1986, "*Instructional Computing--A Look to the Future*" for the Faculty and Students of the Colleges of Engineering, Science, Business, and Education, Utah State University, Logan, UT, Jun 26, 1986.
153. Invited speech, "*Artificial Intelligence and Education*", American Association for Artificial Intelligence Conference, University of Pennsylvania, Philadelphia, PA, Aug 13, 1986.
154. Invited speech, "Relative Roles of the USA Government in Continuing Education", at the Joint Europe/USA Continuing Education Forum, sponsored by British Telecom, Hewlett-Packard, IBM, Philips, Thomson, and the Community in Education and Training for Technology (COMETT), the European Economic Community (EEC), and the European Society for Engineering Education (SEFI), at Palo Alto, California, and White Plains, NY, Sep 16-24, 1986.
155. Featured speech, "*Artificial Intelligence, Technology, and Science Education*", Departmental Seminar, Computer Science Department, Yale University, New Haven, CT, Oct 7, 1986.

156. Presented a paper, "*Intelligent Tutors and Knowledge-based Systems in Education*", and Chaired the Session on Applications of Artificial Intelligence/Expert Systems, sponsored by the Learning Technology Institute, Arlington, VA, Oct 30, 1986.
157. Invited speech, "*Applications of Advanced Technologies: Use of Intellectual Tools*", Department of Education's Project Directors Meeting of Minority Institutions Science Improvement Program (MISIP), University of the District of Columbia, Washington, DC, Nov 26, 1986.
158. Panelist, "*New Vision in Educational Technology*", Science, Technology, and Society Conference on Technological Literacy, Pennsylvania State University, Arlington, VA, Feb 7, 1987.
159. Featured speech, "*Educational Technology: What the Future Holds*", A Teleconference for the Northern Rockies Consortium for Higher Education (20 Colleges in Utah, Idaho, Wyoming, and Montana and Canada), Feb 12, 1987.
160. Featured Speech, "*Educational Technology: Research, Development and the Future*", Invitational Seminar for Faculty and Students, University of Illinois, Champaign-Urbana, IL, Feb 25, 1987.
161. Invited speech, "*Applications of Advanced Technology*", at the Fukutake Education Forum, Washington, DC, Mar 7, 1987.
162. Speech, "*Applications of Advanced Technologies*", National Bureau of Standards and National Science Foundation Seminar for Faculty of Minority Institutions, Washington, DC, May 21 and May 28, 1987.
163. Speech, "*National Programs to Improve Education Through Technology*" (Session Chairman), National Educational Computing Conference (NECC), Philadelphia, PA, Jun 26, 1987.
164. Invited speech, "*Innovations in Computing*", Corporate Educational Technology Council, IBM, Thornwood, NY, Jul 9, 1987.
165. Invited participant, Ohio Conference on *In-Service Training in Mathematics and Computer Science for High School Teachers*, sponsored by Kent State University and the Ohio State Department of Education, Quail Hollow Inn, Painesville, OH, Jul 10-12, 1987.
166. Invited speech, "*Schools of the Future*", at the Science Resource Teachers Workshop, Wootton High School, Montgomery County, MD, Jul 24, 1987.
167. Invited speech, "*R&D and the Effects of Microcomputers in the Classroom*", Apple Corporation Inc. Funder's Forum, Hilton Hotel, McLean, VA, Sep 22, 1987.
168. Invited speech, "*Information Technology: National Needs and School Problems*", New York University Seminar on Restructuring Schools Using Educational Technology", New York University, University Club, New York, NY, Sep 29, 1987.
169. Invited speech, "*Education and the 21st Century*", at the Third Annual General Assembly of the World Teleport Association Conference, Hyatt Regency Hotel, Oakland, CA, October 10, 1987.
170. Invited speech, "*Technology's Impact on Education*", at the "Challenges for Tomorrow's Schools: A Perspective from Space", sponsored by the National Aeronautics and Space Administration (NASA), Holiday Inn, Orlando, FL, Oct 28, 1987.

171. Featured speech, "*Computer in Education: Equity vs. Excellence*", sponsored by the Office of the Vice President for Academic Affairs and the Electrical Engineering and Computer Science Department, George Washington University, Washington, DC, Dec 14, 1987.
172. Invited participant in "*Thinktank on Future Forces Impact on the Field of Communication Disorders*", sponsored by the American Speech-Language Hearing Foundation's "Technology: Advancing Your Profession Conference", at Mesa, AZ, Feb 18, 1988.
173. Invited participant on the "*Expert Panel, Education and Technology*" (Christopher Dede, U.Houston and Harvey Long, IBM) at the Advancing your Profession Conference", sponsored by the American Speech-Language Hearing Foundation, at Mesa, AZ, Feb 19, 1988.
174. Keynote address, "*The New Intellectual Tools of the Future*", at the International Association for Computing in Education (IACE) Conference on Educational Computing: Practice, Policy, and Research, New Orleans, LA, Apr 8, 1988.
175. Invited speech, "*Applications of Advanced Technologies in Mathematics and Science Education*" for Education Ministers from developing countries at the Economic Development Institute of the World Bank, Washington, D.C. Apr 27, 1988.
176. Invited speech, "*Science, Technology and the Future of Education*", at the Library Science Institute, Catholic University, Washington, DC, Aug 9, 1988.
177. Invited participant, "*Technology in Higher Education: A Round Table*", The Academy for Educational Development Inc., Washington, DC, Dec 6-7, 1988.
178. Invited speech, "*Applications of Advanced Technologies in Science Education*", at the "Statewide Instructional Technology Seminar", sponsored by the Maryland State Department of Education, Division of Instructional Technology, Owings Mills, MD., Jan 13, 1989.
179. Invited participant, *Federal Workshop on Distance Learning*, Office of Technology Assessment, U.S. Congress, Washington, DC, Mar 1, 1989.
180. Invited speech, "*A View of the Needs for Education's Future*", at the IBM's Education Initiative Meeting, IBM White Plains, NY, March 20,21, 1989.
181. Invited speech, "*Creating New Intellectual Tools for the Future*", Schools of Education, Computer Science and Electrical Engineering Seminar, at the University of Michigan, Ann Arbor, MI, Mar 24, 1989.
182. Invited speech, "*Technology and Education for America's Culturally and Linguistically Diverse Populations*". Howard University and New York Institute of Technology's Joint Center for Communications, Learning and Technology Conference, at Howard University, Washington, DC. Mar 28, 1989.
183. Invited speech, "*Trends in Education and their Impact on Human Resources and Technical Training in High-Tech Industries*", at the "Software Education for the 90's: Are We Ready Conference", at IBM Thornwood Education Center, Thornwood, NY, Apr 6, 1989.
184. Invited speech, "*Research Themes in Artificial Intelligence and Education*", National Educational Computing Conference, Boston, MA, Jun 21, 1989.

185. Invited speech, "*Computers in Education: A Historical Perspective*", National Educational Computing Conference, Boston, MA, Jun 21, 1989.
186. Keynote Address, "*Using Artificial Intelligence in Education: Computer-Based Tools for Instructional Design*", Utah State University Summer Instructional Technology Institute, Logan, UT, July 29, 1989.
187. Invited speech, "*Research and Development on Advanced Technologies in Education*", at the Bulgarian Academy of Sciences and the U.S. National Academy of Sciences Bi-lateral Workshop on "Use of Computers in Pre-University Education", at the University of California-Davis, Davis, CA, September 6-8, 1989.
188. Invited speech, "*Review of Major, Recent U.S. Education Reform Studies & National Goals Generated by the President's Education Summit Conference*", for the Defense Manufacturing Board, Department of Defense, at the Institute for Defense Analysis, Alexandria, VA, October 10, 1989.
189. Invited speech, "*Information and communication Technology's: Today and in the Future*", at the Lifelong Engineering Education Symposium, Royal Swedish Academy of Engineering Sciences, IVA Rapport 365, Stockholm, Sweden, Oct 27-28, 1989.
190. Invited speech, "*A Review of the Status and Trends in Science and Mathematics Education and Human Resources Development for the Work Force*", at the "Symposium on the Status of Education in America and Directions for the Future", House Education and Labor Committee, U.S. 101 Congress, Rayburn House Office Building, Washington, DC, November 14, 1989. (njlaw.rugers.edu, pp197-204)
191. Invited speech, "*Trends and Research: The Case for Innovative Learning Programs*", at the Productivity and Learning in the Visual Information Age Conference sponsored by Business Week and the Interactive Video Industry Association, Washington, DC, Nov 30, 1989.
192. Invited Participant in "*Vision: Test (Technologically Enriched Schools of Tomorrow)*", a Teleconference Dialog and Delphic Seminar on the innovative applications of technology for schools of the future. Sponsored by IBM Educational Systems and The International Society for Technology Education, Bethesda, MD, May 14-15, 1990.
193. Invited speech, "*Public Education and Information Systems for Information on Global Climate Change*", at the University Council on Water Resources Annual Meeting, West Point USMA, NY, August 1-2, 1990.
194. Keynote Address, "*Biotechnology Education and Information Networks*", at the First International Biotechnology Education Information Network Conference, sponsored by the International Clearinghouse for the Advancement of Science Teaching, the National Research Council, the National Association of Biology Teachers, National Science Teachers Association, UNESCO and the University of Maryland, at College Park, MD, Aug 13-15, 1990
195. Invited speech, "*Strategies for Technology Assessment and Transfer*" at the *Conference on Technology Assessment: Estimating the Future*, at the UCLA Center for Technology Assessment, Los Angeles, CA, Sept. 5-6, 1990.
196. Invited speech, "*Technology as a Tool for Learning*", at the 1990 National Conference on Computer-Based Instruction and Technology Education Programs, sponsored by the U.S. Department of Education, Washington, DC, Nov 28, 1990.
197. Invited Participant in "*Towards a National Information Infrastructure for Education Conference*", sponsored by the Center for Educational Technology and Economic Productivity of New York University, at the Annenberg

Washington Program Center, Washington, DC, Dec 13-14, 1990.

198. Invited Participant on "*Human Brain and Learning Panel*" at the Federal Interagency Conference on the Art and Science of Learning, sponsored by the US Department of Education, Washington, DC January 23-25, 1991.

199. Keynote Address, "*Visions for Multimedia Mathematics and Science Education*", at the Multimedia Math/Science Apprentice Project Meeting, University of Delaware, Newark, DE, Mar 14-15, 1991.

200. Keynote Address, "*Research and Development on the Uses of Advanced Technology in Science Education*", at the Fourth Annual Department of Defense Meeting on Training (T2TG), Arlington, VA, Mar 20-21, 1991.

201. Invite speech, "*International Aspects of Science Education: National Science Foundation Interests*", at the National Research Council, Committee on International Organizations and Programs, Washington, DC, Apr 26, 1991.

202. Invited speech, "*Educational Technology: the State-of-the-Art*", at Jostens Learning Corporation and the Science 2000 Consortium's Science Education Workshop, Washington, DC, May 24, 1991.

203. Invited speech, "*Using Action Research to Improve Teaching and Learning with Microworlds: Commentary*" at the National National Educational Computing Conference, . Phoenix, AZ, Jun 16, 1991.

204. Chair for the Panel, "*Federal Perspectives on Technology and Restructuring*" at the National Educational Computing Conference Workshop, Phoenix, AZ, Jun 20, 1991.

205. Participated on the *Committee on Earth and Environment Workshop on Global Change Education*, University of Rhode Island, Providence RI, July 14-17, 1991

206. Invited speech, "*Information Infrastructure and Health Care*" at the "*Health Care Reform and the Information Age Conference*" for the Health and Human Services, Secretary's Council on Health Promotion and Disease Prevention, Alexandria, VA, July 24, 1991.

207. Invited speech. "*National Research and Education Network (NREN)*", at the High Performance Computing Conference, sponsored by the Oregon Institute for Advanced Computing and the Quantitative Technology Corporation, Rosslyn, VA, Sept. 12, 1991.

208. Invited keynote address, "*Creating and Using New Information and Communications Technologies to Expand Human Capacity*" at the Council of the Great City Schools, Urban Educational Technology Forum, 6th Annual Technology Conference, Chicago, IL, Oct. 16, 1991.

209. Invited seminar, *Computer Interactive Technology and Educational Leadership*, George Mason University, Fairfax, VA, Oct 22, 1991.

210. Invited keynote/featured speech, "*Information Technology in Education: Now and in the Future*", at the "II Convegno Internazionale di Informatica per la Pubblica Amministrazione e per le Forze Armate", Genoa, Italy, Dec. 12-13, 1991.

211. Interview presented on the *Educational Technology Leadership Program* of George Washington University's *Mind Expansion University Series*, Washington DC, January 24, 1994.

212. Sponsor and Participant the NSF/DARPA Workshop, *New Directions in Human-Computer Interaction*,

Education, Research and Practice, Washington, DC Feb 5-7, 1994

213. Invited speech, "*The Future of Educational Technology*", at the Human Factors and Ergonomic Society, Fairfax VA, April 13, 1994.

214. Invited speech, "*Social Change in the Information Infrastructure*", at the *Conference on Computing for the Social Sciences*, University of Maryland, College Park MD, June 2, 1994.

215. *A Symposium on Grants and Contracts in Educational Technologies: Federal Perspective*, at the National Educational Computing Conference (NECC), Boston, MA, June 13, 1994.

216. "*Setting A Research and Planning Agenda in Modeling and Simulation, K-12*", at the National Educational Computing Conference (NECC), Boston, MA, June 13, 1994.

217. Invited featured speech "*Mathematics, Science and Engineering and the Internet*", Aviano, Italy DoDEA April 22, 1996.

218. *Advanced Technology and Individual, Team, and Organizational Learning Systems*, National Science Foundation, 1995.

219. Invited participant for the *Advanced Distributed Learning Workshop* sponsored by the Department of Defense, Alexandria, VA., October 5-8, 1999.